fellow workers in the same cause. It was no small place in English history which belonged to the city whose name stood out in so marked a way in the tale alike of the revolution of the eleventh and the seventeenth centuries. It was no small matter, as we drew near by the western bridge or the eastern isthmus, as we passed where once stood the eastern and the western gates, as we trod the line of the old Roman streets, to think that we were following the march of the Conqueror and the Deliverer; it was no small matter, as we entered the minster of Leofric, Warlewast, and Grandison, to think that the *Te Deum* was there sung alike for the overthrow of English freedom and for its recovery. It was no mean lesson if we had to connect with the remembrances of this ancient city —among so many associations of British, Roman, and English days—the thought that rose above all the rest, the thought that there was no city in the land whose name marked a greater stage in the history of the Conquest of England, that there was none whose name marked a greater stage in the history of her deliverances.

NOTES

FOREIGN honours have been recently falling in showers on the heads of English scientific men. Not long ago the Emperor of Brazil nominated as Knights of the Imperial Order of the Rose, the following gentlemen:—Sir G. B. Airy, Dr. Warren De La Rue, Dr. Birch, Prof. Abel, Major Moncrieff, Capt. Andrew Noble, and Mr. J. Norman Lockyer. The other day, King Oscar II. of Sweden, at his coronation at Stockholm, marked his appreciation of the services rendered by science by conferring distinctions on several men of learning, both Swedes and foreigners. Among the latter were the following eminent scientific men of this country:—Sir Charles Lyell and Sir George B. Airy, named Commanders of the First Class of the Order of the Polar Star; and Professor John Tyndal, Professor Thomas Henry Huxley, and the Director of the Botanical Gardens at Kew (Dr. Joseph Dalton Hooker), named Knights of the same Order.

WE understand that one of the evening discourses at the meeting of the British Association next month will be delivered by Prof. W. C. Williamson, of Manchester, on "Coal and Coal Plants." It is also hoped that Prof. Clerk-Maxwell will deliver a discourse on "Molecules." Several papers on subjects of local interest have also been promised. The following is a list of the vice-presidents and other officers of the Association, the president-elect, as we have already announced, being Prof. A. W. Williamson, F.R.S.:—Vice-Presidents elect: the Earl of Rosse, F.R.S.; Lord Houghton, F.R.S.; W. E. Forster, M.P.; the Mayor of Bradford; J. P. Gassiot, F.R.S.; Prof. Phillips, F.R.S.; John Hawkshaw, F.R.S. Local Secretaries for the meeting at Bradford: the Rev. J. R. Campbell, D.D.; Mr. R. Goddard; Mr. Piele Thompson. Local Treasurer for the meeting at Bradford: Mr. Alfred Harris, jun. General Secretaries: Capt. Douglas Galton, C.B. R.E. F.R.S., Dr. Michael Foster, F.R.S., Trinity College, Cambridge. Assistant General Secretary: George Griffiths, M.A. General Treasurer: William Spottiswoode, F.R.S. Auditors: John Ball, F.R.S.; J. Gwyn Jeffreys, F.R.S.; Colonel Lane Fox, F.G.S. The sections are the following:—A, Mathematical and Physical Science.—President: Prof. Henry J. Stephen Smith, F.R.S. Vice-Presidents: Prof. Balfour Stewart, F.R.S., and Prof. Henrici. Secretaries: Prof. W. K. Clifford, M.A.; J. W. L. Glaisher, Prof. A. S. Herschel, and Prof. Forbes. B, Chemical Science.—President: Dr. W. J. Russell, F.R.S. Vice-Presidents: Prof. Roscoe and I. Lowthian Bell. Secretaries: W. Chandler Roberts, F.C.S.; Dr. Armstrong; and Prof. Thorpe. C, Geology.—President: Prof. Phillips, D.C.L. Vice-President: W. Pengelly Secretaries: Louis C. Miall; William Topley, F.G.S.; R. Tiddeman. D, Biology.—Vice-Presidents: Dr. Beddoe and Prof. Rutherford, M.D. Department of Zoology and Botany.—Secretaries: Prof. Thiselton-Dyer and Prof. Lawson. Department of Anatomy and Physiology.—Secretaries: E. Ray Lankester and Dr. Pye-Smith. Department of Anthropology.—Secretaries: F. W. Rudler, F.G.S., and J. H. Lamprey. E, Geography.—President: Sir Rutherford Alcock. Vice-Presidents: Major-Gen. Sir Henry Rawlinson and John Ball. Secretaries: H. W. Bates, F.R.G.S.; Keith Johnston, F.R.G.S.; and Clements R. Markham, C.B., F.R.S. F, Economic Science and Statistics.—President: Mr. W. E. Forster, M.P. Vice-Presidents: Dr. Farr; Lord Houghton, F.R.S.; E. Baines, M.P. Secretary: J. G. Fitch, M.A. G, Mechanical Science.—President: W. Froude, LL.D. Vice-President: A. Bessemer. Secretaries: H. M. Brunel; J. N. Shoolbred; H. Bauerman.

ON Tuesday the forty-first annual meeting of the British Medical Association was opened in King's College, London, the large hall of which was crowded on the occasion of the general assembly, at 3 o'clock. The General Meeting was presided over by Mr. A. Baker, surgeon to the General Hospital, Birmingham, and president of the Association. After the retiring president had addressed the meeting, Sir W. Fergusson took the chair as president of the Association for the coming year, and read an address of considerable length. It was difficult in the present time, he said, for a president of an association like that to find a suitable subject for an address, as, whatever topic he started with he was immediately surrounded with so many specialists, who of course knew everything better than himself, that he did not know where to stand. The president then entered at much length on the subject of the valley of the Thames and the importance of pure water in a hygienic sense. He suggested that, without having recourse to the expensive process of going to the lakes of Cumberland and Westmoreland for a supply of pure water, there were many streams and rivulets and water sheds where the waters could be confined in lake above lake, and utilised for the supply of London and the large towns. In the evening the Lord and Lady Mayoress held a reception at the Mansion House, which was attended principally by medical gentlemen and their wives and daughters. More than 3,000 were received during the evening.

AMONG the distinguished foreigners now attending the meeting of the British Medical Association in London, may be mentioned—Professors Virchow, Oscar Liebreich, and Baron von Langenbeck, of Berlin; Prof. Busch, of Bonn; Prof. Marey, of Paris; Prof. Chauveau, of Lyons: Prof. Spiegelberg, of Breslau; Prof. Lazarewitch, of Charkow; and Dr. Fordyce Barker, of New York.

ON Monday, the annual meeting of the Cambrian Archæological Association was opened at Knighton, Radnorshire. This Association was established some thirty years ago for the purpose of investigating and preserving the objects of antiquity which abound in the Principality. The first Congress was held at Aberystwith, and the present is the 28th of the series. The President for the past year was Sir J. Russell Bailey, M.P., and the President-elect is the Hon. A. Walsh. The week's programme opened on Tuesday night with the annual meeting and reception of report, after which the President for the year, Sir J. R. Bailey, was to resign the chair to his successor, the Hon. A. Walsh, who was to deliver the inaugural address. The rest of the week will be occupied with excursions, and meetings for the reading of papers.

MR. G. KITCHENER has been elected to the headmastership of the High School, Newcastle-under-Lyne, Staffordshire, in the middle of the Potteries. It is to be the first "First Grade" established as a semi-classical school (*i.e.* without Greek in the ordinary school course). The time thus made available, will enable more attention to be given to Mathematics and Science. The scheme directs that Chemistry and Design should be specially taught, with a view to the Potter's art. The school is to be opened in the spring of 1875.

It has long been familiar to geologists that the western and southern coast-line of Scotland is pierced with caves at different levels, indicating former successive levels at which the sea waves worked. Unfortunately, owing to the want of limestone or very calcareous rocks, these caves as a rule present none of that stalagmite deposit which has elsewhere served so abundantly to cover over and preserve the remains of the ancient denizens of our country with traces of the presence of man himself. The caves usually open directly upon the coast, with free exposure to the air, so that their floors show nothing but damp boulders and pools of water from the drip of the roof. Recently, however, a remarkable exception to these ordinary conditions has been observed on the wild cliff line to the south-west of the bay of Kirkcudbright; the Silurian greywacke is there traversed with strings and veins of calcite along lines of joint and fracture, and at one point where an old sea cave occurs, the walls and floor at the cave mouth, and for a few yards inwards, have a coating of solid calcareous matter. Beneath this coating in the substance of the breccia, which extends across the cave mouth, as well as throughout the cave earth behind the breccia, a great quantity of bones, with traces of human occupation, has been found. A systematic investigation of the cave, commenced last autumn, is being carried on under the direction of Mr. A. J. Corrie and Mr. W. Bruce-Clarke, the discoverers of the osseous layer. At the present time the following, among other remains, have been noted: bones of ox, red-deer, goat, horse, pig, pine-marten, rabbit, watermole, and other small rodents, together with numerous remains of birds, and a few frog and fish bones. Intermingled with these occur fragments of bronze, bone needles, and other bone implements, to the number of more than twenty. One piece of worked stone (a fragment of greywacke) has been found, but as yet not a single chip of flint. A full account of the cave will be published as soon as the investigations are completed.

A CONFERENCE of the City Companies, under the presidency of his Royal Highness the Prince of Wales, was held at Marlborough House, on Monday, July 21, with the view of discussing how technical education might be promoted by those companies acting in concert with the International Exhibition. It was unanimously agreed that the City Companies should give their best support to the object which the meeting had in view, and Mr. Cole, C.B., explained that the Commissioners had determined that, during the months of August, September, and October, schools should be admitted to the Exhibition by ticket, at three-pence each scholar, and that, during the month of August at least, frequent lectures each day would be given on the various subjects and processes exhibited. He suggested that the City Companies, in addition to sending their own schools to attend these lectures, might purchase tickets, and place them at the disposal of the London School Board, to enable them to award them as prizes. Such tickets might also be distributed among other public schools.

AT a meeting held at Grosvenor House on July 17, a Provisional and an Executive Committee were formed for the establishment of a National Training School for Cookery in connection with South Kensington. The Committee of Management of the Lectures on Cookery at the International Exhibition have been urged to take this step from the comparatively great success monetarily and otherwise, of these lectures. The meeting agreed that the Executive Committee of the present School for Cookery be an Executive Committee to prepare a scheme and issue the same. The meeting also agreed to the following resolutions:—1. That the establishment of a Training School for Cookery, to be in alliance with the School Boards and Training Schools throughout the country, is most desirable at the present time. 2. That the aim of the proposed school should be to teach the best methods of cooking articles of food in general consumption among all classes. 3. That an Association should be formed with the intention of making the School self-supporting. 4. That it would be prudent to secure a capital, say 5,000*l*., which might be raised by means of donations giving the privilege of nominating students in the School, as well as by means of a guarantee fund; it is estimated that an expenditure of about 1,000*l*. would be required to fit up a practical school or laboratory. The Provisional Committee, containing several Royal and noble names, were authorised to take the necessary measures to establish the school by means of shares, donations, and guarantees. Assuming the necessary capital to be provided—and we hope there will be no difficulty nor delay in doing so—the Executive Committee hope that they may be able, before the end of the year, to establish courses of practical instruction in the kitchen, as well as lectures. Arrangements will be made so that courses may be severally attended by pupil-teachers in training for public education, by domestic servants, and by ladies. The experiment of this school will be first tried in London, and if it succeeds, similar schools will be established in the large towns. We sincerely hope such a laudable scheme will meet with perfect success. All communications on the subject of the school should be addressed to the Secretary (*pro tem.*) of the school, Annual International Exhibitions, Kensington Gore, London, S.W.

ARRANGEMENTS have been made with Mr. P. Simmonds for the delivery each day of six short lectures on the industries illustrated in this year's International Exhibition. These lectures will be commenced on Saturday next.

ON Saturday a deputation from the Trades' Guild of Learning which was formed for the promotion of technical education in the various trades and industries of the United Kingdom, waited upon the Marquis of Ripon at the Privy Council Office, with a view of urging upon the Government the desirability of taking further steps to promote a higher technical education. The deputation included Sir A. Brady, Mr. H. Solly, and others. Sir A. Brady said what the working-men wanted was not money but a fair start. They felt that enough had not been done in utilising the resources of the South Kensington Museum. The Chancellor of the Exchequer had acted very penuriously in the matter. One way in which they could be assisted was by the establishment of a class of instructed teachers and the attaching art schools to the museums. The Rev. Mr. Solly said that the great body of the intelligent artisans, who were largely represented on the council, found that the benefit of the services they received from the Educational Department almost wholly failed to reach themselves. This failure arose principally from the following causes:—First, because the sources of information were not readily accessible as to what the Department really aimed at with a view to assist them. Secondly, the workmen in the East-end of London found the cost of the journey to the South Kensington Museum to be too great in time and money, and therefore they desired that two or three other well-furnished museums should be established in other parts of the metropolis. The next point was that the Department should not only assist classes which had made some progress, but classes in their incipient stages, and which required nursing. The last and most important point of all was, that however able the Government teachers were to instruct in Science and Art, they were not able to give that practical instruction in any trade which the workman might pre-eminently need and desire. The apprenticeship system had practically broken down. The Marquis of Ripon said that if Mr. Solly's paper were sent in it should receive careful consideration.

NOTWITHSTANDING the vast importance of St. Paul's Cathedral and the impossibility of making up for its loss were it destroyed, until recently it was in imminent danger of being shattered by every thunderstorm that passed over it. The lightning-rods that were supplied to it 120 years ago have long been utterly useless, and from its position, size, and certain peculiarities of structure, the noble building formed a tempting object of attraction to the destructive stroke of lightning. Happily, we learn from the *Telegraphic Journal*, this is no longer the case. The authorities, dissatisfied with the electrical state of the building, upon the report of Mr. John Faulkner, Associate of the Society of Telegraph Engineers, of Manchester, commissioned him to prepare a plan for the fitting of the cathedral with an efficient system of conductors. The plan submitted was approved, and the fitting is now completed. In metallic connection with cross and ball and scrolls are eight copper conductors, each being a ¾-inch strand of copper wires. The octagonal strand has been adopted as giving most metal in the least space. These eight conductors then pass to the metallic railing of the Golden Gallery, with which they are in metallic connection. Thence they are carried down to the dome, to the metallic surface of which they are again connected at several portions of their length. Then down the rain-falls, over the leaden roofs of the aisles, in the angles formed by the aisles themselves, again down the rain-falls to the sewers. Further, the choir and nave roofs are connected together by a saddle or conductor stretching over them both, and joined to the conductors proceeding from the summit of the west towers. Even this did not satisfy the zealous care of Mr. Faulkner, who tested, sheet by sheet, the electrical condition of the leads, connecting the worse insulated sheets by copper bands to the better conducting surfaces. Thus the dome, aisle-roofs, and ball and cross, and the two west towers, form one immense metallic conductor, and the danger arising from interior gas-piping is removed; for Coulomb and Faraday have proved beyond doubt that electricity accumulates upon the surface only of bodies. In the sewers, which always afford a moist earth connection, the copper strands are riveted to copper plates, and these again are pegged into the earth. By this means as good an earth connection is obtained at the top of the cross, at the very summit of the Cathedral, as is found in the sewers at its base.

THE Examinations in the Crystal Palace School of Practical Engineering, for the Easter term, commenced last Saturday, and will close on Friday, August 9th. The Autumn Term will commence on Monday, September 8. The Principal will attend in the school from 10 till 4 each day, from Saturday, August 2nd, to Friday, the 8th, to pass Candidates for admission.

AN earthquake occurred at Jamaica at 0·30 A.M. on July 1, which created much alarm. It lasted nearly five seconds.

AMONG Mr. Murray's announcements of forthcoming works are—"Personal Recollections, from Early Life to Old Age," by Mary Somerville; "The Geography of India, Ancient and Modern," by Colonel Yule, C.B.; "The Naturalist in Nicaragua," by Thomas Belt, F.G.S.; and a popular edition of Mr. H. W. Bates's "The River Amazons."

A NEW and cheap edition of Mr. James B. Jordan's "Elementary Crystallography" has been published by Mr. Murby as one of his series of science manuals. To any one commencing the study of crystallography this manual will be very useful, especially as appended to the letterpress is a series of carefully drawn nets for the construction of models illustrative of the simple crystalline forms.

THE report of the annual meeting of the Perthshire Society of Natural Science shows that Society to be in a prosperous and good working condition. The number of members is large, and among them is a fair proportion of workers. We are glad to see that excursions have been started, and hope they will be continued; no richer field, we are sure, than the County of Perth, especially for Botany, exists in this country. The Society, under the energetic management of Dr. Buchanan White, of Dunkeld, is publishing a Fauna and Flora of Perthshire, and it is under its auspices the *Scottish Naturalist* is brought out. During the last summer Mr. J. Allen Harper turned out, for the purpose of acclimatisation, about 7,000 living specimens of the following molluscs: *Helix virgata*, *H. pisana*, and *Bulimus acutus*. The annual address of the president, Col. Drummond Hay, occupies the greater part of the report, and gives many interesting details concerning the birds of Perthshile. The Society has entered on the seventh year of its existence.

THE following are the chief additions to the Brighton Aquarium during the past week:—4 Corkwing Wrasse (*Crenilabrus melops*); 7 Pogge (*Agonus cataphractus*); 1,000 Prawns (*Palæmon serratus*); several groups of *Serpula contortuplicata* and *Alcyonium digitatum*. Four young rough-hounds (*Scyllium canicula*) have been hatched from eggs laid during the last week in January. The period of their development in *ovo* is therefore six months. A large number of young Squid (*Loligo vulgaris*) have also been hatched from spawn brought in by fishermen.

THE additions to the Zoological Society's Gardens during the last week include an Ocelot (*Felis pardalis*) from America, presented by Mr. A. B. Keymer and Mr. C. C. Lovesy; a Togue Monkey (*Macacus pileatus*) from Ceylon, presented by the Sergeants of the 1st Batt. Scots Fusiliers; a grey Ichneumon (*Herpestes griseus*) from India, presented by Mr. G. S. Daintry; a starred Tortoise (*Testudo stellata*) from India, presented by Capt. C. S. Sturt; two lesser black-backed Gulls (*Larus fuscus*), presented by Mr. C. W. Wood; two crested Pigeons (*Ocyphaps lophotes*), hatched in the Gardens; a Hoffmann's Sloth (*Cholopus hoffmanni*) from Panama, and a black-eared Marmoset (*Hepale jacchus*) deposited.

METEOROLOGY IN HAVANNA *

TO judge from the pamphlets mentioned below, the practical study of Meteorology seems to be pursued at the Cuba Observatory with diligence and a harvest of good results. The care and skill with which they are compiled must lead to the conclusion that science will receive very valuable aid both in meteorological and magnetic research from this station of the West Indies.

The observatory is situated at a height of 19·297 metres above the sea level, in N. lat. 23° 8′ 14″·5, its longitude being 76° 9′ 42″·8 west of San Fernando, and therefore 82° 22′ 6·95 west of Greenwich. The first volume is a yearly meteorological and magnetic report, and consists entirely of monthly tables and curves of the daily mean results of the barometer, thermometer, tension, humidity, wind, evaporation, rain, and state of sky. For each month the daily maximum, minimum, and mean values are given, and then follows a table of the monthly means for every even-hour of the day and night. The direction and force of the wind are shown on a circular diagram, and the mean daily values of the barometer, thermometer, tension, and humidity are exhibited by broken lines. Rain curves are added from May.

Regular two-hourly observations of the Magnetic Declination were commenced on April 1, 1871, and the same details are given as for the barometer, &c. To these were added at the

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* Observaciones Magneticas y Meteorologicas del real Colegio de Belen de la compania de Jesus en la Habana, de 30 Nov. 1870 a 30 Nov. 1871.

Memoria de la Marcha regular o periodica, et irregular, del Barometro en la Habana des de 1858 á 1871 inclusive, por el R. P. B. Vines, S.J.

Observaciones correspondientes al mes de Octubre de 1870, con la descripcion de los huracanes ocurridos en la Isla en dicho mes.